Distr.
GENERAL

UNCTAD/COM/31
7 January 1994

ENGLISH ONLY

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

MARKET TRENDS AND RECENT DEVELOPMENTS IN MARKETING OF NATURAL RUBBER

Study by the UNCTAD secretariat

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatever on the part of the secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

GE.94-50121

CONTENTS

		Paragraphs
I.	INTRODUCTION	1 - 2
II.	TRENDS IN MARKETS FOR NATURAL RUBBER	3 - 21
	A. Global balances and prices	3 - 10
	B. Trends in supply	11 - 16
	C. Trends in demand	17 - 21
III.	PRICE FORMATION IN INTERNATIONAL MARKETS FOR NATURAL RUBBER	22 - 70
	A. Review of organized markets and price formation	24
	1. Singapore	25 - 29
	2. Kuala Lumpur	30
	3. London	31
	4. New York	32
	5. Tokyo and Kobe	33
	B. Factors contributing to decrease in trading on organized markets	34
	1. Absence of price volatility	35 - 36
	2. INRO's price stabilization interventions in the organized physicals markets	37 - 42
	3. Growth of direct trade bypassing organized markets	43 - 44
	4. Improved communications and shipping	45 - 48
	5. More traded qualities and stricter quality specifications	49
	6. Slow response of futures exchanges to changing needs of participants	50
	7. Low use of futures by producers and manufacturers	51 - 53
	C. Some recent developments concerning price formation	54
	1. Physicals prices	55 - 59
	2. Futures prices	60 - 65
	3. The EFP mechanism as a means to link direct trade with the futures market and strengthen price formation	66 - 70
IV.	GLOBALIZATION OF WORLD TYRE MANUFACTURING	71 - 77
V.	RESEARCH AND DEVELOPMENT	78 - 81
VI.	INTERNATIONAL CO-OPERATION	82 - 84

I. INTRODUCTION

1. This report gives a brief review of trends and salient features of supply and demand for natural rubber over the years 1981 to 1991, the latest year for which complete data are available. Some aspects of recent developments in pricing of natural rubber, its processing and marketing are also discussed.

2. Natural rubber exports are a considerable source of income for the producing countries. Total world exports reached a value of $US 5.0 billion in 1988 but declined in 1991 to $US 3.4 billion, mostly because of a fall in prices. Earnings on natural rubber of the three major countries exporting it, Indonesia, Malaysia and Thailand, were respectively 3.3, 2.8 and 3.4 per cent of their total merchandise trade in 1991. For the smaller exporting countries, Côte d'Ivoire, Nigeria, Sri Lanka and Viet Nam, the shares were respectively, 1.9, 0.4, 3.2 and 2.7 per cent.

II. TRENDS IN MARKETS FOR NATURAL RUBBER

A. Global balances and prices

3. As seen in Table 1, world production of natural rubber exceeded world consumption in the years 1981 to 1984. While estimated stock at the world level increased, it was the buffer stock purchased by the International Natural Rubber Organization (INRO) in accordance with its price stabilization operations which picked up the surplus of production over consumption. Commercial stocks, or non-INRO stock, actually declined from 1981 to 1983 but edged up in 1984 although to a level less than that in 1981.

4. A reversal occurred in 1985 when world consumption exceeded production. The shortfall was met out of commercial stock but INRO stock increased as buying took place to support price in the latter part of the year.

5. The balance shifted again in 1986 and 1987 as world production exceeded consumption in each year. World stocks increased as commercial stocks rose and some of INRO's stock was sold at the end of 1987 when prices suddenly and unexpectedly shot up to levels where INRO was allowed to sell.

6. As a result of factors affecting both supply and demand, the situation changed again in the years from 1988 to 1990 as world consumption was larger than production in each year. The bulk of INRO's stock was sold in 1988 as part of the Organization's price stabilization activities and the remaining part was sold in 1989. As INRO sold stock in 1988, commercial stocks increased greatly. Commercial stock increased again in 1989 but fell in 1990, as INRO bought.

7. Again a shift occurred in 1991 as world production far exceeded consumption. The massive surplus was absorbed by a sharp increase in commercial stocks and some buffer stock purchased by INRO.

8. For the first nine months of 1992, world production continued to exceed consumption. INRO purchases were made in the months of August to October 1992.

9. World production, consumption, total stock, INRO stock and the INRO Daily Market Indicator Price (DMIP) are illustrated in Chart 1. Despite the seemingly small differences between production and consumption and the resulting small differences in world stocks, the price fluctuated in swings. It is thought that low short-term price elasticities of supply and demand contribute to such price movements.

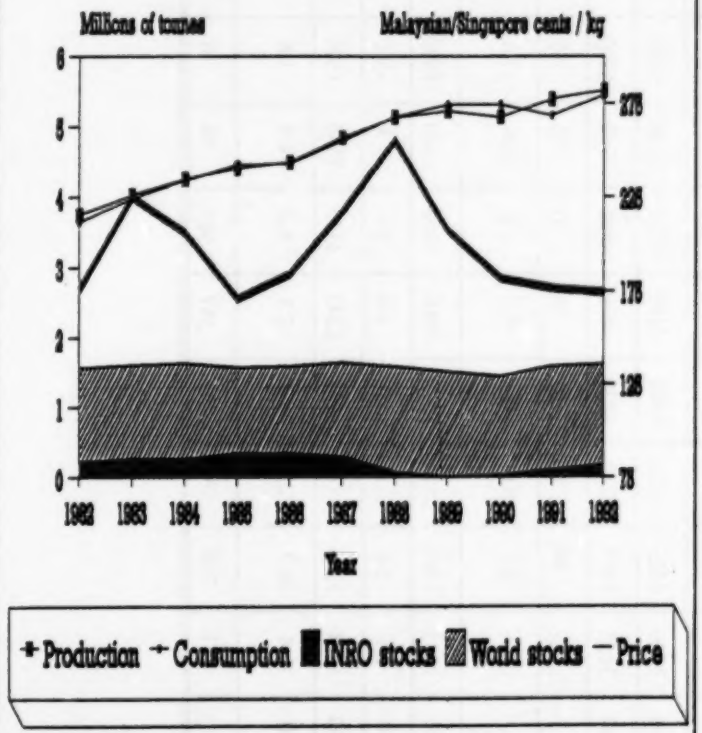
10. It is significant that INRO's price stabilization operations were successful in keeping prices from breaching the Lower Trigger Action Price or "floor" price and in defending the Upper Trigger Action Price or "ceiling", as illustrated in Chart 2. The price broke through the ceiling, however, in 1988 when the buffer stock was exhausted.

TABLE 1: NATURAL RUBBER SUPPLY/DEMAND BALANCE, 1981-1991
(1000 tonnes)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Average 1981-91	Annual average change (1981-91) per cent/year
World Production	3705	3750	4025	4255	4400	4490	4850	5130	5240	5200	5330	4580	3.1
World Consumption	3700	3655	3995	4230	4420	4460	4800	5160	5290	5240	5150	4555	3.0
Supply/Demand Balance	5	95	30	25	-20	30	50	-30	-50	-40	180	25	
Surplus/Deficit as % of Production	0.1	2.5	0.7	0.6	-0.5	0.7	1.0	-0.6	-1.0	-0.8	3.4	0.5	0.6
Estimated Stocks	1440	1535	1565	1590	1570	1600	1650	1620	1570	1530	1710	1580	
Per Cent Change in stocks	0.0	6.6	2.0	1.6	-1.3	1.9	3.1	-1.8	-3.1	-2.5	11.8		1.7
Commercial Stocks	1439	1304	1295	1321	1213	1243	1345	1546	1570	1496	1659	1403	
Per Cent Change in commercial stocks	0	-9.4	-0.7	2.0	-8.2	2.5	8.2	14.9	1.6	-4.7	10.9		1.6
INRO Buffer Stocks in store	1	231	270	269	357	357	305	74	0	34	51	177	

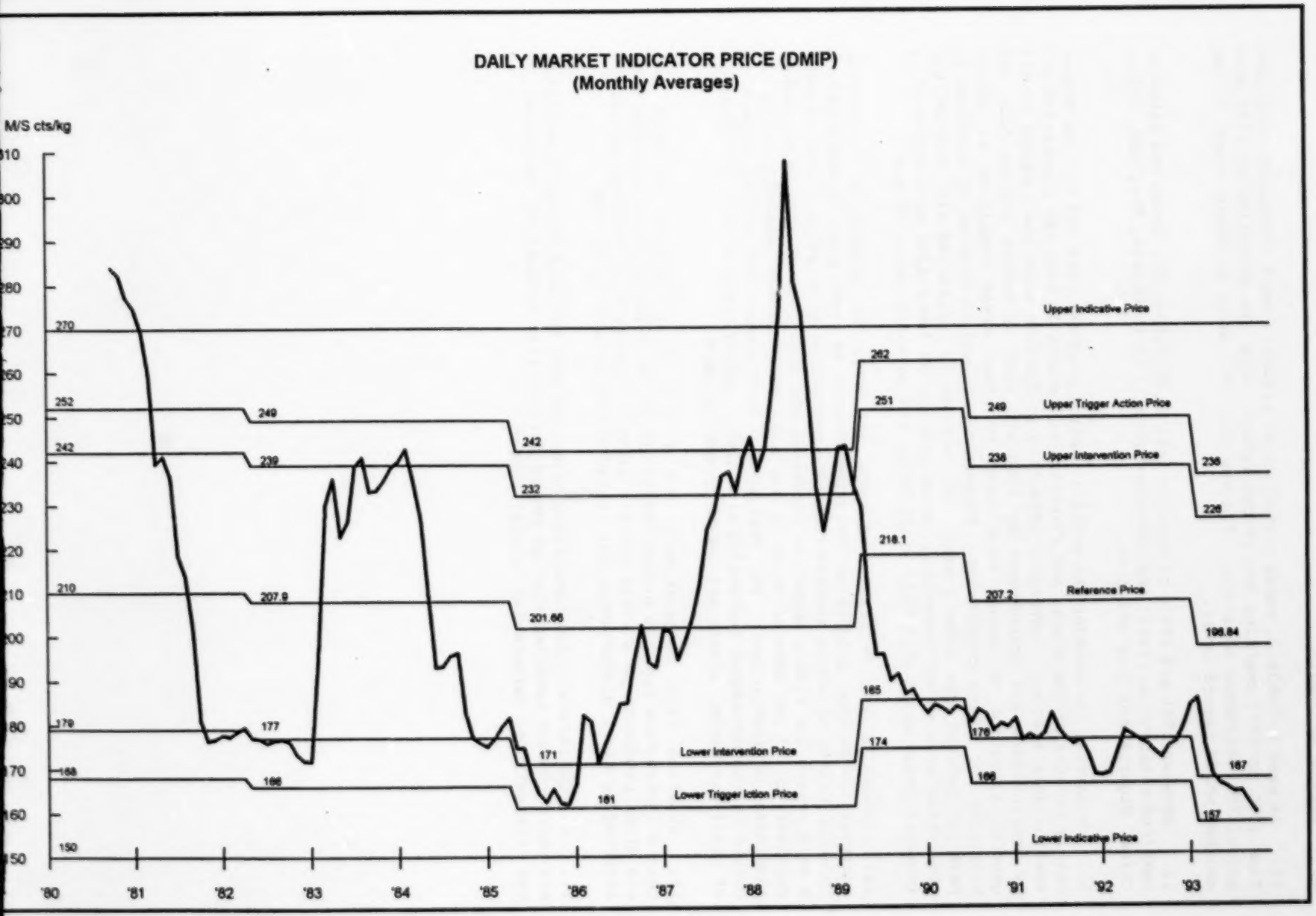
Source: INRO

CHART 1
WORLD PRODUCTION, CONSUMPTION, STOCKS AND PRICES OF NATURAL RUBBER, 1982-1992



Source: International Rubber Study Study Group (IRSG), Rubber Statistical Bulletin.
Stocks refer to those reported at the end of the year.

DAILY MARKET INDICATOR PRICE (DMIP)
(Monthly Averages)



B. Trends in supply

11. As seen in Table 2, world production of natural rubber increased every year from 1981 to 1991 reaching new record levels, with the exception of 1990 when production decreased slightly. Figures for 1992 show an annual rate at yet another world record level.

12. Between 1981 and 1991, production fell in Malaysia, Sri Lanka and Liberia, remained constant in Brazil and increased greatly in Indonesia, Thailand, India, China, Nigeria and Côte d'Ivoire.

13. Malaysia, for decades the world's leading producer, has had falling output mainly because of low prices and unattractive returns in both the plantation and smallholders sectors. Adversely affecting production were low tapping levels by smallholders and abandonment by some who took up better paying jobs and general migration of labour from rural to urban areas resulting in labour shortages for rubber production. Conversion of land to housing or planting in palm oil reduced area under rubber. An increase in replanting also reduced the productive area as old trees still producing but at low yields were replaced by immature trees which will only yield after six to eight years of age.

14. Indonesia and Thailand had huge increases in production. Despite unattractive prices, production increased sharply as trees planted years before in anticipation of better returns came into production in actual difficult times. A main reason for rising output in Indonesia was expansion of area under rubber cultivation, 83 per cent of which is now under smallholders ownership while the remainder is plantations. For Thailand, a main reason for strong growth in output is its successful replanting with high yielding trees as well as expansion of cultivated area, almost all owned by smallholders.

15. Starting from comparatively low levels of production, Nigeria and Côte d'Ivoire have had high proportionate increases in production, although they are minor producers on a world scale. Liberia's production has been seriously affected by civil disturbances but it had strong growth up to 1988.

16. All the natural rubber exporting countries have had loss of export earnings and their growers have experienced severe difficulties because of low prices in the international markets for natural rubber.

TABLE 2. PRODUCTION OF NATURAL RUBBER, 1981 - 1991

(1000 tonnes)

COUNTRIES	1981		1982		1983		1984		1985		1986		1987		1988		1989		1990		1991	
Malaysia	1510	(41)	1494	(40)	1564	(39)	1531	(36)	1470	(33)	1539	(34)	1579	(33)	1662	(32)	1415	(27)	1292	(25)	1253	(24)
Indonesia	868	(23)	880	(23)	997	(25)	1116	(26)	1130	(26)	1049	(23)	1203	(25)	1235	(24)	1256	(24)	1262	(24)	1337	(25)
Thailand	504	(14)	552	(15)	587	(15)	629	(15)	726	(17)	786	(18)	926	(19)	979	(19)	1179	(22)	1271	(24)	1341	(25)
Sri Lanka	124	(3)	126	(3)	140	(3)	142	(3)	138	(3)	138	(3)	122	(3)	122	(2)	111	(2)	113	(2)	104	(2)
India	151	(4)	166	(4)	168	(4)	184	(4)	198	(5)	219	(5)	227	(5)	255	(5)	289	(6)	324	(6)	360	(7)
China	128	(3)	153	(4)	172	(4)	189	(4)	188	(4)	210	(5)	238	(5)	240	(5)	243	(5)	264	(5)	269	(5)
Liberia	72	(2)	68	(2)	77	(2)	86	(2)	84	(2)	89	(2)	93	(2)	108	(2)	106	(2)	40	(1)	19	(0)
Nigeria	49	(1)	47	(1)	50	(1)	51	(1)	52	(1)	37	(1)	55	(1)	81	(2)	118	(2)	152	(3)	153	(3)
Côte d'Iviore	24	(1)	27	(1)	31	(1)	36	(1)	41	(1)	49	(1)	55	(1)	61	(1)	67	(1)	69	(1)	71	(1)
Brazil	30	(1)	33	(1)	35	(1)	36	(1)	40	(1)	33	(1)	27	(1)	33	(1)	31	(1)	30	(1)	30	(1)
World Total	3700		3750		4025		4255		4400		4490		4850		5130		5240		5200		5330	
Annual Change	-150		+50		+275		+230		+145		+90		+360		+280		+110		-40		+130	

Source: INRO

Notes: 1. World total refers to total production of all countries, including those not listed above.

2. Figures in parentheses refer to percentages of world production

C. Trends in demand

17. As seen in Table 3, the trend in consumption of natural rubber has been upward over the years 1981 to 1991. The trend of synthetic rubber consumption has also been rising but started from a much higher level in 1981 than did consumption of natural rubber. Natural rubber accounted for 33.2 per cent of the total consumption on average over the period. Its market share, however, increased from 30.2 per cent in 1981 to 35.7 per cent in 1991. Expansion of production of radial tyres was an important factor in the increase in natural rubber's market share, since radial tyres require a larger proportion of natural rubber than other kinds of tyres.

18. Consumption trends of the EEC, major countries and the CIS are seen in Chart 3. While the general trends are upward for all but the CIS, a serious decrease in levels of the EEC and the United States occurred in 1989 and 1990 due to recession in their economies. That of the CIS reached a new low in 1991.

19. Domestic consumption of natural rubber in the three major producing countries, Indonesia, Malaysia and Thailand, grew at a rapid rate although still a small part of off-take of their production or as a per cent of world natural rubber consumption. It is significant from a development perspective that these countries are pursuing further processing of their commodity rather than relying on exports of the raw material. Also, their domestic consumption of natural rubber for manufacturing now represents about 8 per cent of world consumption whereas in 1981 it accounted for only 4 per cent of total natural rubber consumption.

20. Apart from domestic consumption in the producing countries, all natural rubber enters into international trade before it is utilized in manufacturing of tyres and other rubber products. There is no domestic production of natural rubber in developed countries as it is a tropical crop. Trends in natural rubber imports and exports therefore generally follow consumption of the EEC, CIS and major importing countries.

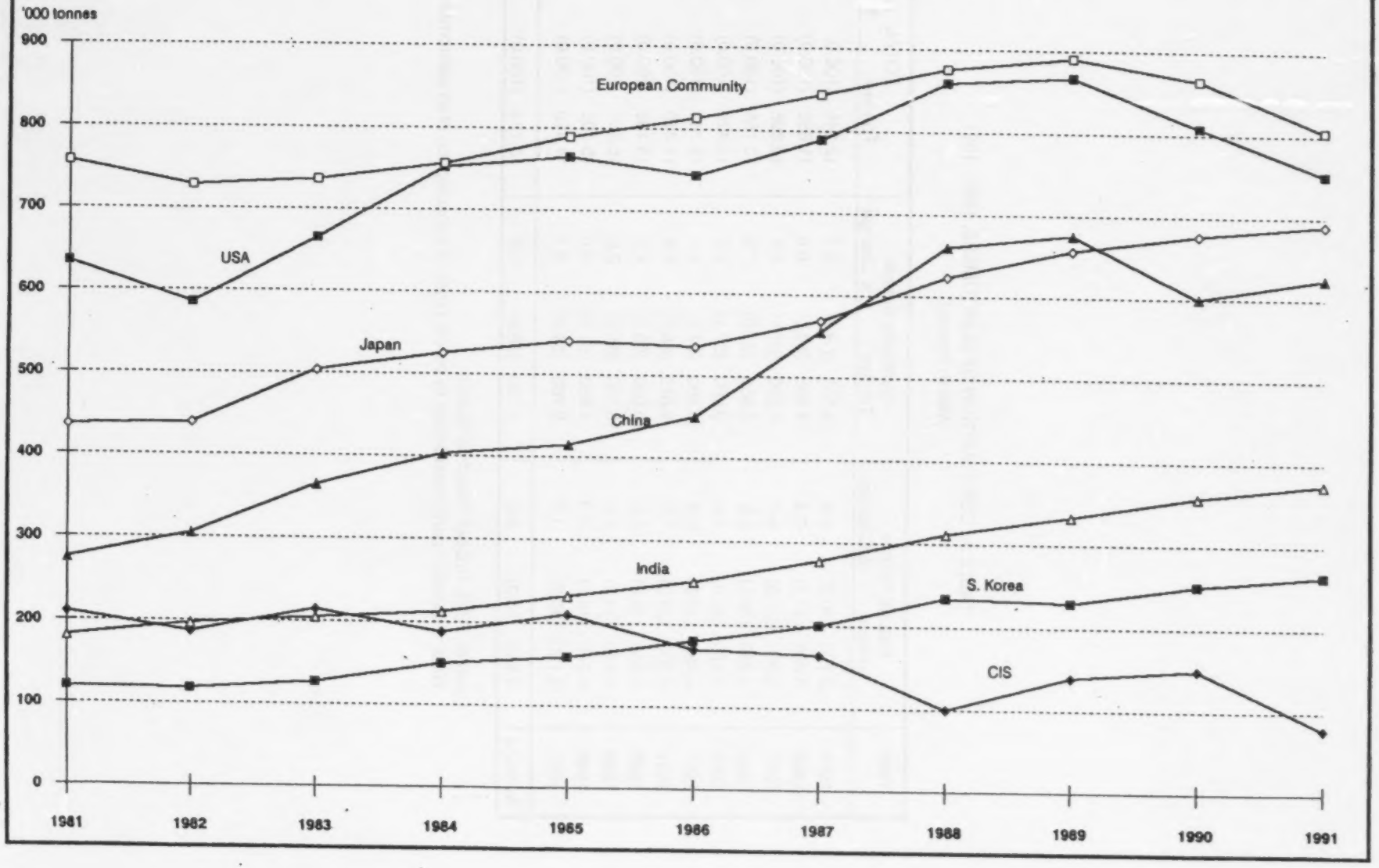
21. The main destinations of Indonesia's rubber and percentage shares for each are: the United States (44), the EEC (12) and, for transshipment, Singapore (22). Malaysia's major destinations are: the EEC (27), the Republic of Korea (14) and the United States (11). Thailand mainly exported to Japan (39), China (15) and the EEC (11). A large number of other countries accounted for remaining markets.

TABLE 3 : CONSUMPTION OF ELASTOMERS, 1981 - 1991
(Million tonnes)

Year	Natural Rubber			Synthetic Rubber			TOTAL		
	Tonnes		% Change	Tonnes		% Change	Tonnes		% Change
1981	3.700	(30.2)	-1.6	8.545	(69.8)	-2.7	12.245	(100.0)	-2.4
1982	3.665	(31.5)	-0.9	7.985	(68.5)	-6.6	11.650	(100.0)	-4.9
1983	3.995	(32.5)	9.0	8.300	(67.5)	3.9	12.295	(100.0)	5.5
1984	4.230	(32.1)	5.9	8.955	(67.9)	7.9	13.185	(100.0)	7.2
1985	4.420	(32.9)	4.5	9.000	(67.1)	0.5	13.420	(100.0)	1.8
1986	4.460	(32.5)	0.9	9.280	(67.5)	3.1	13.740	(100.0)	2.4
1987	4.800	(33.3)	7.6	9.610	(66.7)	3.6	14.410	(100.0)	4.9
1988	5.160	(34.0)	7.5	10.000	(66.0)	4.1	15.160	(100.0)	5.2
1989	5.290	(34.5)	2.5	10.060	(65.5)	0.6	15.350	(100.0)	1.3
1990	5.240	(34.7)	-0.9	9.860	(65.3)	-2.0	15.100	(100.0)	-1.6
1991	5.150	(35.7)	-1.7	9.260	(64.3)	-6.1	14.410	(100.0)	-4.6
Average	4.555	(33.2)	3.0	9.169	(66.8)	0.6	13.724	(100.0)	1.3

Source: IRSG, Rubber Statistical Bulletin.
Note: Figures in parentheses refer to percentages of consumption of all elastomers

Chart 3: NATURAL RUBBER CONSUMPTION



III. PRICE FORMATION IN INTERNATIONAL MARKETS FOR NATURAL RUBBER

22. A decade or more ago, price formation in international trade in natural rubber was guided by a global network of organized markets which was cohesive and integrated. Market developments and price movements were well disseminated and the pricing mechanisms were generally thought to reflect the state of supply and demand, although the markets were subject to some currency and other speculative interests unrelated to rubber. Since that time, the volume of trade and the numbers of participants in the organized markets have fallen while the volume of trade carried out directly between producers and consumers has risen. Concerns have been expressed as to whether the organized markets are functioning adequately in price formation, not only for setting the prices for natural rubber traded in these markets but also to guide the price discovery for direct trade between producers and consumers.

23. The following sections give a brief review of the organized markets, the main factors cited for the decline in trade and numbers of participants on these markets in the 1980s and early 1990s and some recent developments on strengthening these markets and their role in price formation.

A. Review of organized markets and price formation

24. Organized markets for natural rubber have traditionally been comprised of a series of primary and terminal markets with some of them servicing participants in the broader international trade. Primary markets largely provide services for transfer of ownership, payment, storage and transport from producers and sellers to the ports of shipment whereas terminal markets or distributive markets cover comparable services from the ports of discharge to consumer factories. The characterization of "terminal" has no relation to the delivery date of a contract. As for other commodities, standard contracts for future delivery traded on organized exchanges for hedging or speculative purposes are called futures and the markets for them are referred to as futures markets or the paper market. Physicals trading on organized markets refers to bilateral contracting between producers, exporters, dealers or brokers, on one hand, or dealers and consumers on the other. The organized markets all have official bodies to ensure orderly conduct of trade through enforcement and observance of their rules and bye-laws.

1. Singapore

25. Traditionally, Singapore has been an important international market for natural rubber for dealers and purchasing agents operating on behalf of major rubber manufacturers. Its success is attributable not only to its geographic location in the centre of the region producing most of the world's natural rubber but also to modern and efficient port, banking and other services. Some of the long-established large dealers and packers/millers have expanded their activities to neighbouring producing countries and thus achieved a level of integration in marketing.

26. Since the 1920s, Singapore has had leading futures and physicals markets in terms of turnover and influence in price formation. Prior to the 1980s, it was known for participation of local big speculators who bought and sold rubber

futures purely in the hope of making financial gains. The role of the Singapore physicals and futures markets in price determination has continued while other markets have declined in importance.

27. The Singapore market worked in the past through a core of brokers who maintained telephone contacts with the region's dealers, whether they were loose dealers, smokehouse owners, packers, exporters, importers or other dealers trading with them. The brokers gave bid and offer prices for the internationally traded RSS1 grade of natural rubber, a high quality ribbed smoked sheet (RSS) which, however, represented only a small part of the trade. The official prices in Singapore were compiled by a panel of price givers drawn from the membership of the Rubber Association of Singapore (RAS) who advised the secretariat of the RAS about what they believed the prices should be just before noon each day. An appropriate range of prices was chosen and announced by the media at 12 noon each day. These prices were used for a number of transactions by producers and traders. The price discovery mechanism was thought to work well, although it appeared secretive and was not transparent.

28. On 27 May 1992, the Rubber Association of Singapore Commodity Exchange (RASCE) opened with trading in futures for RSS1 sheets denominated in Singapore dollars and two mass tyre grades, RSS3 in US dollars and TSR 20 in Singapore dollars. Technically specified rubber (TSR) is preprocessed rubber ready for industrial use. Trading at the RASCE is based on a screen trading system called the Network Execution and Transfer (NEAT) system, which acts as the central clearing house for information and trading data. Brokers continued their past practice of giving offer and bid prices but are now called market-makers and post their bids/offers on their NEAT terminals. This information is immediately posted to other participants in an effort to assure price transparency and equal access to the futures market by all market participants regardless of where they are geographically. Also disseminated for each contract and month or quarter are information on the last traded price, the day's high and low prices, the previous day's settlement price, the current day's traded volume and the current open interest.

29. The RASCE started with seven market-makers including three Japanese houses, (Okato Shoji Singapore, Kanetsu Singapore and Yutaka Shoji Singapore) and four local firms (Dexin Commodities Singapore, Transworld Rubber, Bee Rubber Co., and Phillip Trading). In addition, it had 13 clearing members and 58 non-clearing members. The average daily turnover volume to the end of 1992 was about 7,000 tonnes, a level above the pre-opening forecast of 6,000 tonnes per day. However, of the three contracts, the volume was highest for RSS1 and lowest for RSS3.

2. Kuala Lumpur

30. Kuala Lumpur has long been an important organized primary market starting with the Malaysian Rubber Exchange (MRE) and later the Kuala Lumpur Commodity Exchange. Agency houses handled large quantities of rubber produced by estates, the bulk of which was later sold on the London market. The packers and millers were the main outlets for small estates and smallholdings which represented two-thirds of Malaysia's production. The packers/millers purchased from middle dealers and their offer prices were derived from prevailing prices in overseas markets. Also participating in the Kuala Lumpur market were local branch offices or subsidiaries of foreign commodity trading companies as well as brokers. Close traditional links between Kuala Lumpur and Singapore resulted in interrelated

activities and ownership of trading companies. Where once there was active trading in futures in Kuala Lumpur, there has been none since July 1989 because of insufficient interest in trading them.

3. London

31. The London market, in existence since the turn of the century was, as of the late 1970s, still a leading terminal market and centre for international trade, and it had an active futures market for trade hedging and speculation. Physicals trading was carried out by dealers who bought rubber from the producing countries and resold it to smaller dealers and consuming factories all over Europe. Some brokers in London specialized in this trade while others were engaged solely in futures trade. Some large Malaysian producers maintained offices in London to sell to dealers and consumers. Trade was carried out under the rules of the Rubber Trade Association of London (RTAL). The futures market was operated by the London Rubber Terminal Market Association (LRTMA). Future trading in London ceased in the mid-1980s because of insufficient volume of trading.

4. New York

32. New York has traditionally been an important terminal market for the United States. Physicals trading in New York was carried out under the rules of the Rubber Trade Association of New York. Dealers secured their supplies from other dealers and producers in primary markets. The New York Commodity Exchange (COMEX) had futures trading in rubber for many years but suspended it in 1970 due to lack of trade interest. In 1974, COMEX tried to revive trading in rubber futures but had to abandon it again in 1975. The New York Coffee, Sugar & Cocoa Exchange also tried to initiate trading in rubber futures in 1975 but it too ceased activity because of a poor response. New York dealers were said to hedge their positions in London and Singapore.

5. Tokyo and Kobe

33. Tokyo and Kobe have been traditional terminal markets for Japan's rubber manufacturers, importers and speculators. The Tokyo Commodity Exchange and the Kobe Rubber Exchange both have trade in rubber futures for RSS3. Participants are mainly Japanese interests. Arbitrage takes place with the RASCE in Singapore which also has trading in futures for RSS3.

B. Factors contributing to decrease in trading on organized markets

34. The following subject areas give an overview of some factors which have contributed to decrease in trading in physicals and futures. Extensive discussions of price discovery for natural rubber have taken place over the years in the International Rubber Study Group (IRSG) as a special subject in addition to the Group's regular functions of providing statistical information and assessing the market situation and outlook for rubber.

1. Absence of price volatility

35. Absence of price volatility, in the sense of short-term price fluctuations which would attract futures transactions for speculative or hedging purposes, has been cited as a factor which has led to decline in trading on the futures

markets in the 1980s. This assertion may seem surprising in view of the very sharp and large price rises and falls which took place in the 1980s, as seen in Chart 2. However, without the benefit of hindsight, perceptions were that the market prices would continue at low levels with minor fluctuations. Market participants generally did not perceive prospects for sharp upward movements in prices and when they did occur they were unexpected. Moreover, in the rapidly rising price trend from mid-1987 to mid-1988, much natural rubber had already been committed in direct contracts between producers and consumers and the market intermediaries could not perform their balancing role.

36. On the other hand, the large and sharp downward movements in prices were seen as returning to the general situation of ample supplies, low prices and small price fluctuations, hence of little speculative or hedging interest.

2. INRO's price stabilization interventions in the organized physicals markets

37. The International Natural Rubber Organization (INRO), established under the International Natural Rubber Agreement, 1979 and its successor of 1987 has, at times, intervened with purchases and sales from its buffer stock in accordance with the price range and other provisions of the Agreements. In particular, purchases were made on the organized physicals markets from late 1981 to early 1983 and again in mid-1985 in successful operations to support prices. The entire buffer stock was sold during the high price period running from September 1987 to March 1989 in an effort to fill imbalances between production and consumption, and defend the upper limit of the price range.

38. The natural rubber market got off to a sluggish start in 1990 as sentiment was bearish on reports of slower economic growth and declining sales in the motor vehicle and tyre industries in many industrialized countries. Purchases were made for the buffer stock in the first quarter of 1990 to support prices. No further purchases were made until the second half of 1991. Purchases were again made in August through October 1992 to sustain prices.

39. In the above-mentioned periods of purchases and sales, the buffer stock had a direct and strong influence on world physicals prices and futures prices. However, in the intervening periods, prices fluctuated in response to market fundamentals and were at quite steady levels for long periods as well as perceived to remain around these levels.

40. There appears to be considerably divergent views between traders and economic analysts over the role of the buffer stock with regard to price formation. Traders have asserted that market participants seem to have exhibited a preference for certainty of prices at the buffer stock's price limits, since market prices have tended to cluster around either the lower part of the range or its upper part. Economic analysts hold that market fundamentals determined price levels and the broad swings in them while the buffer stock's only role in price formation was during those periods where interventions were made to keep market prices from going beyond the price range.

41. As regards the context in which trading takes place and the function of the buffer stock, the buffer stock is not designed to change the trend of prices in the middle no-intervention zone, nor is it designed to make market prices average out over a long period at the reference point or mid-point of the price range.

42. The buffer stock's aim is to keep market prices from exceeding certain limits in the interests of producers and consumers. By comparison, futures are used in a market that allows prices to respond to fundamentals. They serve to transfer risks of adverse price movements from those not wanting to bear them to those who do so in the hope of making financial gains.

3. Growth of direct trade bypassing organized markets

43. Direct trade between producers and consumers that bypasses market intermediaries is often cited as the main reason for the drop in trading on the organized markets for natural rubber. Direct trade has grown considerably from little in the 1960s to an estimated 40 per cent of world trade in natural rubber in the mid-1980s and an estimated 60 to 70 per cent at present. The growth in direct trade may be seen as a manifestation of some basic factors discussed in the following sections as well as of closer integration and decision-making by a smaller number of buyers for tyre manufacturers which is discussed separately in Chapter IV on the globalization of rubber manufacturing. Other kinds of direct trade bypassing the organized markets are countertrade, barter and, in a general sense, growth of processing in the natural rubber producing countries since supply lines between growers and manufacturers are short.

44. Of the natural rubber producing countries, Malaysia and Indonesia are thought to be the largest users of direct trade. Much of this trading is done by large rubber manufacturing organizations and estates, factories producing technically specified rubber (TSR) or central processing facilities. An advantage of direct trade for producers is assurance of sales, especially when demand and prices are weak. Qualities traded are thought to be higher than average qualities in normal open trade and are concentrated on TSR20 and RSS3, the volume grades for making tyres. Average price contracts are written to supply at a price which is to be determined in relation to the Singapore benchmark prices in the period of one week to one month before delivery. A premium or discount in relation to the reference price is included. As quality traded is generally better than average quality in open trading, a premium is usually paid. Direct contracts on a fixed price basis or a combination of fixed and average price bases can also be made. Direct trade contracts of any type are usually for delivery in nearby months but may call for delivery of up to one year ahead. Direct trade contracts are sometimes referred to as long-term contracts, as they sometimes go beyond the 2 or 3 month period for delivery that is common in forward contracts for physicals.

4. Improved communications and shipping

45. Prior to the 1980s, dealers were an important link in communications of price and other market information, and in arranging the transportation of supplies of natural rubber. Trade associations in the organized markets published their official daily prices for physicals. These prices were determined by a committee in each association which generally represented brokers and dealers. The official prices were used as bases for subsequent negotiations

between contracting parties. There was thought to be a strong relation between futures prices and physicals prices, as the futures or "paper" market reflected market expectations.

46. As noted in paragraph 27, official prices in Singapore were announced daily at noon and broadcast and otherwise circulated in the region. These prices served as a basis for a large variety of contracts involving producers, as they were thought to be a fair reflection of the market despite their lack of transparency. But, the official noon prices reflected conditions only at that time. They were not real time prices in the sense of continuous and instantaneous communications.

47. Over time, communications have become instantaneous with mobile telephones and mobile fax machines. Producers and consumers can keep informed in order to easily deal in natural rubber without going through the organized markets and the intermediaries, including loose dealers and international dealers although the latter too now receive better market information.

48. Similarly, where shipping problems once were an obstacle to direct trade, facilities and services have improved and consumers need not go through the organized markets and intermediaries to acquire supplies on time. In two or three weeks, natural rubber can be shipped from the South-East Asian producing region to almost any industrialized country. Problems in shipping from African natural rubber producing countries still remain. These problems, together with uncertainty about qualities, have contributed to low export prices for natural rubber from the African countries.

5. More traded qualities and stricter quality specifications

49. Natural rubber was once traded only as sheets of various grades or ungraded. The introduction of preprocessed natural rubber ready to use in industrial applications as technically specified rubber (TSR) in the 1970s was a major innovation. Since then, the increasingly strict technical requirements of tyre manufacturers have led to direct contracting with suppliers to meet their special quality needs, thus bypassing the organized markets and intermediaries. Efforts are being made to make TSR from different sources interchangeable for a given grade, e.g. TSR20. It is unlikely that natural rubber will ever return to being a more homogeneous commodity by reducing the number of grades in view of the trend toward it becoming a more sophisticated industrial input. A comprehensive quality control system, such as the ISO 9000 guidelines, is needed to meet consumer requirements for quality. An idea has been mooted that natural rubber will become so heterogeneous and manufacturers requirements so specific that it will eventually be sold by highly specialized producers on the basis of list prices for sales to manufacturers, much as synthetic rubber manufacturers sell their rubber now.

6. Slow response of futures exchanges to changing needs of participants

50. During the 1980s, futures trading in Singapore declined and in London it stopped altogether. A reason cited for these results is that the futures exchanges did not keep up with changes that were taking place in the needs of buyers and sellers. An example is the slow response of the exchanges in introducing a TSR contract to complement the RSS contract, while for a long time TSR represented a considerable part of exports. Another example is the use of RSS1 in futures trading in Singapore while RSS3, which follows somewhat different

price movements, represented the bulk of trade in sheets. Thus, a hedging operation in RSS1 could increase risk of loss on trade in RSS3 as compared to an unhedged deal. A further example is the initiation of futures trading in Kuala Lumpur which involved a change in trading method from the whispering to the open cry system and a change in financial management that did not match the requirements perceived by the traders.

7. Low use of futures by producers and manufacturers

51. Futures markets have been used largely by dealers of various types. Producers and rubber manufactures have made relatively little use of futures despite well known arguments in favour of using them to "lock-in" attractive prices.

52. One reason cited for the low level of participation of producers is that most of them are smallholders and do not have the necessary volumes of production individually to engage in large enough operations to use futures. Large estates and parastatal organizations, notably in Malaysia, could use futures, if they chose to do so.

53. It is said that major tyre manufacturers have never participated in the futures market. One view is that they perceived the futures market to be lacking in sufficient volume of trade to reliably use futures. Another possible reason is that by buying regularly and in accordance with their needs they can arrive at an annual average purchase price that is close to the market average and this is a satisfactory result for their purposes. Manufacturers, in their purchasing strategies, are said to be mainly interested in maintaining competitiveness with each other in cost of purchases of natural rubber rather than whether natural rubber price levels are generally low or high. With the growth in interest in risk management stemming from currency and interest rate operations, use of futures is becoming a more easily accepted concept for rubber manufacturers.

C. Some recent developments concerning price formation

54. Trading in futures has received much more attention recently than has trading in physicals. As trading has fallen on the Singapore futures market, the only remaining important international exchange, much attention has been given to proposals on how to increase activity on the exchange as the last remaining futures market which could maintain a close relationship with physicals prices. Should it fail, market participants would have no other alternative than to trade through their own systems of contacts with companies, using official prices for physicals, a prospect seen with much anxiety by producers and consumers. The continuance of the Rubber Association of Singapore Commodity Exchange (RASCE) itself is not in question. It is the brokers and dealers who may not be able to continue, if their level of business declines.

1. Physicals prices

55. Official daily prices for physicals continue to be published by the respective rubber trade associations in the organized markets in Singapore, Kuala Lumpur, London, New York, Tokyo and Kobe. These official prices are used in subsequent negotiations between contracting parties. The Singapore award contract for TSR20 is one such official price and reportedly the reference price most widely used by producers. The Singapore RSS1 continues to be another, despite its small share in world trade.

56. Efforts are being made to make supplies from various sources interchangeable on, for example, TSR20 contracts in order to make trading more open and competitive. The growing number and strictness of quality specifications works against aggregation of grades. Heterogeneity of the commodity is, however, a needed feature of trade so as to provide manufacturers with qualities they need and producers with the premiums and discounts associated with them as incentives and disincentives to production. The trend toward more sophistication of qualities of natural rubber is irreversible, as noted in paragraph 49 above.

57. A problem in the present price determination for physicals is that official prices are generally based only on the supply/demand conditions seen by the representatives of the respective rubber trade associations, and not on a true global supply/demand perspective, including the huge amount of direct trade. The mechanism thus does not engender confidence of buyers and sellers. They look mainly to the Singapore market for guidance as the only remaining active international physicals and futures markets.

58. Proposals have been suggested for expanding trade through intermediaries and establishing price determination committees to cover as many participants and as much trade as possible. Pricing committees would consider expected levels of production and consumption as well as the current figures.

59. Better information on quantities and other aspects of direct trade would assist all participants in judging market conditions. This action would imply major institutional changes as the information on direct trade is now considered highly confidential by the parties involved and, even if devulged, ought to be subject to some verification.

2. Futures prices

60. Proponents of futures trading as an import element of price formation see a need to strengthen the relationship between the futures and the physicals markets on a global basis in a globalized market which would translate supply and demand conditions with as much transparency as possible into accurate and accepted world prices for natural rubber. In this way, the futures and physicals link should function as an accurate mechanism in guiding world prices for actual trade.

61. Proposals have been made to redirect more international trade through the intermediaries and, connected with them, appeals have been made to all market participants to make use of the Singapore futures market. While it would seem unrealistic to expect that trade could once again become almost wholly handled through intermediaries which would actively use futures, it may be possible to reactivate the Singapore market to a point where its volume and participation is sufficiently large that both buyers and sellers of physicals and futures place great confidence in it setting accurate world prices for natural rubber. It is noteworthy that other commodities, such as soyabeans, wheat, natural gas and crude oil, have been traded with a combination of open markets and direct trade.

62. Two broad steps have been taken to strengthen futures trading by increasing trading volume and participation. The first was to try to centralize in Singapore the remaining pockets of interest in futures in the world with the aim of revitalizing the Singapore exchange. The second is a plan to link trading in Singapore with trading in various other locations in the world.

63. For internationally linked futures markets, interchangeability of contracts or trading in the same contracts is an important feature. Common quotations of prices would be essential. Currencies and grades of futures contracts would have to be agreed but would be difficult to select to best meet the multiple interests of users of futures. Improving features of contracts would similarly be an intricate area but of vital importance to attract users.

64. The Association of Natural Rubber Producing Countries (ANRPC) has proposed linking of regional markets including Singapore's RASCE. Electronic linkage and setting up of futures markets in Thailand and Indonesia is now considered by the ANRPC to be superior to an earlier idea for a central market to which feeder markets would have channelled trade. Elements in the trading, clearing, guarantee and regulatory system are being studied. Initially, the RASCE would be linked to the Kuala Lumpur Commodity Exchange (KLCE) pending establishment of futures markets in Thailand and Indonesia which will take time.

65. For natural rubber, there has not been use of options or use of futures for protection or speculation by option writers. Options could possibly meet needs of producers, intermediaries and consumers, as well as being attractive to speculators. They could perhaps add to the volume of futures traded and numbers of participants in futures markets. It is noteworthy that, for other commodities, options have added to liquidity of futures markets and complemented futures rather than being competitors to them.

3. <u>The EFP mechanism as a means to link direct trade with the futures market and strengthen price formation</u>

66. The exchange for physicals (EFP) scheme of the Rubber Association of Singapore Commodity Exchange (RASCE) is reported to be attracting consumer interest.

67. Currently, direct contracts between producers and consumers require delivery of certain tonnages of rubber at prices that are determined in relation to the Singapore benchmark prices. The new EFP scheme of the RASCE allows producers to sell futures contracts and consumers to buy them with the possibility for the sellers and buyers to balance their trading at the end of each month with the physical delivery of rubber. The scheme was originally designed to get around the problem of low trading volumes on slow market days when prices are not favourable to producers or to consumers. The EFP scheme, however, has the capacity to internalize in price formation on the futures market the huge direct trade now representing an estimated 60 to 70 per cent of world trade in natural rubber, while preserving the advantages of direct trade.

68. If agreement could be reached between producers and consumers that all deliveries arising from contracts for direct trade will be effected through EFPs on a centralized futures market, a more accurate world price must emerge on the futures market since all changes in supply and demand forces would be reflected in the futures market.

69. A scheme outlining typical operations involving EFPs is seen in Chart 4.

70. As an example, Producer A has a direct contract to sell rubber for December delivery to Consumer B at a premium of 3 cents per kilo above the futures

exchange's benchmark price for RSS1. They execute the operations shown in Charts 5 and 6. The example is based on those given in an article by Quek Kar Tung, "How to overcome the effects of product differentiation and direct trading on price discovery and hedging", ANRPC News, September 1992. The results are:

- Producer A "locked in" a sales price at S$ 1.38 (i.e. S$ 1.35 plus 3 cents premium) on 4 May;

- Consumer B (who has a policy of not transacting in the outer months) pays S$ 1.13 which is 3 cents above the benchmark current month price as contracted;

- Producer A and Consumer B mutually arrange to off-set their futures contracts in an EFP and at the same time deliver rubber based on the contracted product and delivery specifications which are different from the exchange's specifications; and

- Most important of all, from the point of view of world price formation, changes in economic forces of demand and supply are reflected in the centralized futures market, thus influencing the benchmark price.

Chart 4

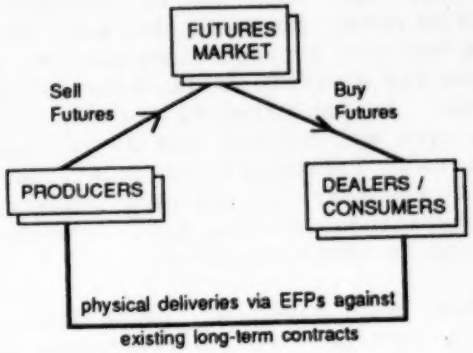


Chart 5

DIRECT CONTRACT AND EXCHANGE FOR PHYSICALS (EFP)

DATE	CONSUMER B			PRODUCER A		
	Cashflow		Action	Action	Cashflow	
	In	Out	Taken	Taken	In	Out
4 May				Producer A sells into futures market to "lock-in" price. Short December S$1.35*		
29 Nov			Consumer B buys futures. Long December at S$1.10			

*lock-in price

Chart 6

DIRECT CONTRACT AND EXCHANGE FOR PHYSICALS (EFP)

DATE	CONSUMER B			PRODUCER A		
	Cashflow		Action	Action	Cashflow	
	In	Out	Taken	Taken	In	Out
29 Nov			EFP at S$1.10 based on current price of S$1.10.		S$0.25	
2 Dec		S$1.13	Takes delivery and pays for deliveries at S$1.10 plus contractually agreed premium of 3 cents		S$1.13	
NET PAY-MENT		S$1.13		NET PRO-CEEDS	S$1.38	

*lock-in price plus agreed premium

IV. GLOBALIZATION OF WORLD TYRE MANUFACTURING

71. Rubber manufacturing has come to be closely identified with tyre manufactures. It should be noted, however, that much natural rubber is destined for production of a wide variety of other items such as conveyor belts, gaskets, footwear, hoses, covering for electric cable, bearings and engine mountings, to name only a few products. An estimated 60 per cent of global natural rubber consumption is used in tyre manufacture and 40 per cent for making non-tyre products. However, in main industrialized countries with their large tyre manufacturing industries, the share of the tyre industry is higher at about 75 per cent while the non-tyre industrial production accounts for 25 per cent of natural rubber consumption in these countries.

72. Much attention has been given to globalization of the world tyre manufacturing industry, a term by which is meant that the activities involved are increasingly carried out worldwide and that participants are increasingly inter-dependent. Extensive discussions on this subject have taken place in the International Rubber Study Group and in the International Natural Rubber Organization.

73. Globalization is a process of expansion of manufacturing companies through joint ventures, technical co-operation agreements between firms, voluntary mergers of existing companies, and acquisitions or takeovers of firms by others. The underlying reasons for these actions relate to technological, financial and marketing factors.

74. Technological advancement has been an important factor in globalization of the world tyre industry. The development of radial tyres, which have a much longer operating life than crossply or bias-ply tyres, is an example. As a result of their introduction and widespread use in the 1970s and 1980s together with a generally poor market for tyres, world manufacturing capacity had to be reduced as well as retooled for manufacture of radial tyres at enormous investment cost. These factors favoured the globalization process as the weaker companies were taken over or joined with the stronger ones in various ways. Substantial investments in R&D have been required to both meet the increasingly stringent technical specifications of the vehicle industry and to keep up with progress made by competing tyre manufacturing firms.

75. The world tyre industry is presently dominated by a small number of large companies centred in North America, Europe and Japan but with worldwide operations. Table 4 compares the value of tyre sales of the top ten companies in 1978 and 1989. The main movements of these large companies over the past ten years were that Bridgestone acquired Firestone; Uniroyal merged with Goodrich Tire to form Uniroyal-Goodrich Tire which in turn was acquired by Michelin; Sumitomo bought Dunlop which disengaged itself from Pirelli which in turn purchased Armstrong; and Continental acquired General Tire.

76. The ten companies seen in Table 4 accounted for 82.3 per cent of world tyre sales of US$ 47 billion in 1989. The position of the three largest companies, Bridgestone, Goodyear and Michelin, is particularly noteworthy.

77. For the producers of natural rubber, the consequences of globalization in the tyre industry are important. As noted in paragraphs 43 and 44, producers are now trading with highly specialized buyers for manufacturers through direct trade contracts. Moreover, the number of such buyers has decreased with the

consolidation that took place in the tyre industry. Another consequence is that natural rubber is becoming more and more of a high-tech industrial input in response to the increasingly stringent requirements of manufacturers. A third result is that globalization has brought with it an increase in tyre manufacturing in the natural rubber producing countries and more of their natural rubber is thus being consumed domestically.

TABLE 4: TYRE SALES BY MAJOR COMPANY

	1978			1989		
Ranking	Company	Country of Origin	Type Sales (US$ billion)	Company	Country Of Origin	Tyre Sales (US$ billion)
1.	Goodyear	USA	5.5	Bridgestone	Japan	8.5
2.	Michelin	France	4.2	Goodyear	USA	7.9
3.	Firestone	USA	3.4	Michelin	France	7.7
4.	Pirelli/ Dunlop*	Italy/UK	3.3	Continental	Germany	3.7
5.	*			Pirelli	Italy	3.0
6.	Bridgestone	Japan	1.8	Sumitomo	Japan	2.7
7.	General	USA	1.5	Uniroyal Goodrich**	USA	1.9
8.	Uniroyal	USA	1.2	Yokohama	Japan	1.7
9.	Goodrich	USA	1.0	Toyo	Japan	0.9
10.	Continental	Germany	0.7	Cooper	USA	0.7

* Pirelli and Dunlop had a technical/sales agreement but remained separate companies.

** Uniroyal Goodrich reported its sales as an independent company because Michelin's purchase was delayed to April/May 1990. The combined sales of Michelin/Uniroyal Goodrich total $9.6 billion compared to Bridgestone's $8.5 billion.

Source: INRO
IRSG
Rubber and Plastic News (20 August 1990).

V. RESEARCH AND DEVELOPMENT

78. Natural rubber is a commodity with a great potential for benefits from research and development in its production and use as an industrial input. Of special interest is scientific research on increasing yields of rubber trees and on improving the manufacturing and end-use characteristics of natural rubber.

79. In sixty years, the productivity of rubber trees has risen six-fold to over 3,000 kilos per hectare on experimental plots. Theoretical considerations suggest that the limit to yield lies somewhere around 9,000 kilos per hectare and annual yields of 7,000 kilos per hectare are considered achievable through highly sophisticated breeding techniques and under ideal growing conditions. These figures compare with average yields of 1,300 kilos per hectare on Malaysian estates and 936 kilos per hectare on Malaysian smallholdings in 1992, while yields in other producing countries were lower.

80. Another area for research and development is improving the characteristics of natural rubber in manufacturing processes and in end-use performance. Past gains in perfecting new forms of natural rubber such as technically specified rubber (TSR), thermoplastic rubber and epoxidized rubber demonstrate that important improvements can be made. Nearly half of natural rubber exports are now marketed in technically specified block forms. Another recent success is epoxidized natural rubber which is just starting to be commercially produced. It is chemically altered natural rubber which opens new markets for natural rubber in competition with some synthetic rubbers since it has good oil resistance and resistance to air permeability. The latter factor is important in uses such as inner tubes for tyres. Epoxidized natural rubber also has improved wet skid resistance, an important characteristics for tyre tread.

81. A wide range of R&D subjects are of importance to further processing and marketing of manufactured products containing natural rubber. These technical areas concern both the industrial processes themselves and the end-use performance of the manufactured products.

VI. INTERNATIONAL CO-OPERATION

82. International co-operation on natural rubber at the intergovernmental level has existed since 1944 when the International Rubber Study Group (IRSG) was founded. The activities of the Group then and to the present are: discussion of aspects of the world rubber industry including the production, marketing and distribution of synthetic and natural rubber and the consuming industries, publishing on a regular basis statistics of the world industry and conducting economic and statistical studies of subjects of particular importance to the industry. IRSG presently has 25 member countries. It also has a Panel of Associates comprised of 27 private sector companies and associations representing both natural and synthetic rubber sectors as well as the manufacturing sector.

83. The International Natural Rubber Organization (INRO) was established in 1980 under the International Natural Rubber Agreement, 1979 and continued under the International Natural Rubber Agreement, 1987. Price stabilization through the operation of a buffer stock, as discussed in Chapter II, has been INRO's primary purpose, although recently some projects on other measures have begun. The International Natural Rubber Council is currently considering renegotiation of the 1987 Agreement. The Agreement is due to expire on 28 December 1993, unless the Council decides to extend it for a period of up to two years.

84. Among producing countries, the Association of Natural Rubber Producing Countries (ANRPC), established in 1970 has brought together the main Asian producing countries. The activities of the ANRPC centre on conducting studies of the world rubber situation and problems facing the natural rubber sector, promoting research and development in production, marketing and consumption of natural rubber and co-operation with other international organizations.